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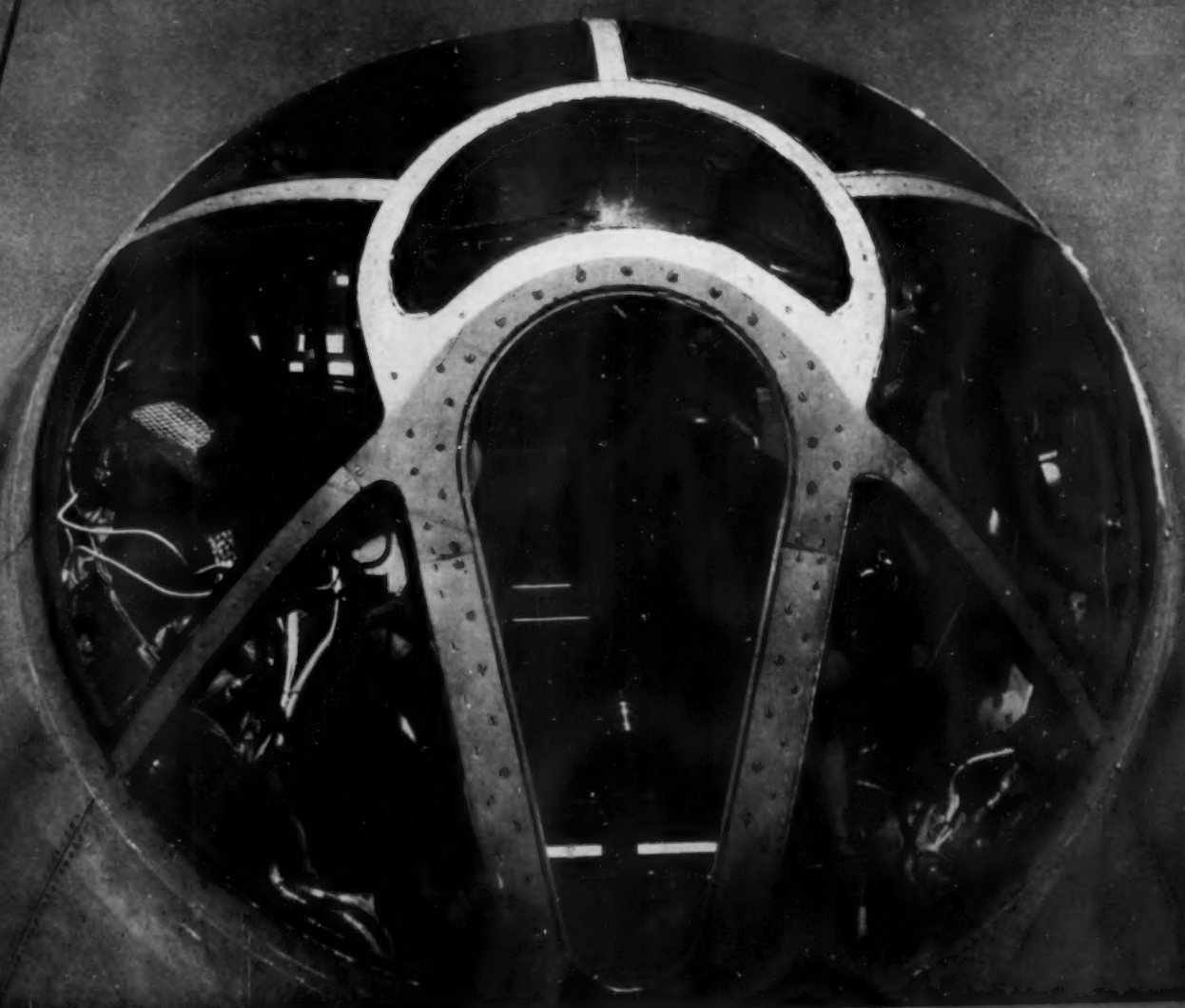
TECHNOLOGY 15123

# SCIENCE NEWS LETTER

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Vol. 49, No. 22

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JUNE 1, 1946



"Shooting" the Bikini Test

See Page 344

A SCIENCE SERVICE PUBLICATION

1921

TWENTY-FIFTH ANNIVERSARY

1946

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## MEDICINE

# More Medical Conquests

New vaccines, antibiotics and drugs active in test tube against fungi, tuberculosis bacilli and diphtheria germs have been presented to the world.

➤ FOUR MORE medical conquests have been presented in their preliminary stages to the world:

1. Vaccine to protect against parrot fever or psittacosis.
2. Vaccine to protect against rabbit fever or tularemia.
3. A new antibiotic (penicillin-like) drug active in the test tube against fungi, tuberculosis bacilli and diphtheria germs.
4. A possible treatment for anthrax infection.

These new weapons against disease, not yet ready for front-line use by physicians, were discussed at the first postwar meeting of the Society of American Bacteriologists in Detroit.

In addition to these promises for the future, eight preventives or remedies of major disease plagues have been made available in the war years since 1944 when the bacteriologists last met. These are disease weapons actually in use or proved and ready for early use. They are: (1) Vaccine against influenza; (2) Vaccine against rinderpest, dread cattle disease; (3) Vaccine against dengue fever, mosquito-borne malady; (4) Globulin from human blood to protect children against measles; (5) Globulin for protection against infectious hepatitis, popularly known as jaundice from one of its symptoms; (6) Vaccine against typhus fever; (7) Two new remedies for malaria better than quinine, and (8) Streptomycin for one kind of meningitis, urinary tract infections and possibly tularemia, undulant fever and other conquered diseases.

Food, most pressing problem in this hungry world today, may become more plentiful or more nourishing through studies by the scientists. Micro-organisms in the soil help crop plants grow. Others reduce the food supply of the world by the spoilage they cause. Still others, some of those that live in the intestinal tract of man and animals, produce some of the vitamins needed for good nutrition. New useful knowledge may be expected on these problems and the related one of what food germs themselves need for best growth so that scientists can study them outside the body to devise new ways of killing them, new vaccines

to protect against their attack, and reap bigger harvests of antibiotics like penicillin and streptomycin.

## Possible Tularemia Cure

➤ STREPTOMYCIN may turn out to be a cure for tularemia, or rabbit fever, but hopes for a streptomycin conquest of tuberculosis are dwindling, it appears from reports to the meeting.

This anti-germ chemical from organisms that live in the earth saved from 80% to 100% of mice given killing doses of rabbit fever germs even when the germs had a 72-hour start on their deadly work. When treatment was delayed as long as 96 hours, the drug still saved almost half the animals.

These studies, with their suggestion of a cure for human rabbit fever victims, were made by Lieut. (j.g.) S. S. Chapman, of the Navy, Capt. Lewis L. Coriell, of the Army Medical Corps, Sgt. S. F. Kowal, pharmacist's mate W. Nelson and Miss Cora M. Downs at Camp Detrick, Md., where some of our defenses against germ warfare were forged during the war.

The ineffectiveness of streptomycin in tuberculosis is due to the fact that the drug only checks the growth of TB germs. To be effective in a disease like tuberculosis, a drug probably must be able to kill the germs, Dr. George E. Rockwell of Milford, Ohio, explained. He found the drug germ-checking but not killing in both test tube and laboratory animals.

The treated animals lived longer than untreated ones, but when the streptomycin was stopped, they began to decline and died. Examination after death showed they had as extensive tuberculosis involvement as the untreated animals.

Further evidence that streptomycin is unlikely to become a remedy for tuberculosis was reported by Dr. Guy P. Youmans of Northwestern University Medical School and Dr. William H. Feldman of the Mayo Foundation. Tuberculosis germs become resistant to streptomycin, it appears. Germs from tuberculosis patients who had been getting the drug

for a long period were able to grow in the test tube even when large amounts of streptomycin were added. Germs from the same patients before treatment were kept from growing in the test tube by one-thousandth the amount of streptomycin that failed to check growth of germs which had become used to the drug in the course of treatment of the patients.

Getting the germs off dishes, glasses and eating utensils in restaurants is more a matter of thorough soap and water washing to remove soil than of rinsing in very hot water, Dr. Murray P. Honwood of Massachusetts Institute of Technology reported.

If the dishes are washed really clean, they can be made "sterile" or germ-free by rinse water at 145 to 150 degrees Fahrenheit as well as at 160 to 180 degrees, he found.

## Drug for Lockjaw

➤ LOCKJAW, which our grandmothers dreaded when someone stepped on a rusty nail or pricked himself with a rusty pin or needle, may soon be conquered by an antibiotic drug of the penicillin class.

The cause of this deadly ailment was not the rust on the nail or pin but a poison produced by germs called tetanus bacilli. They are found in the soil in many regions and could get on nails or pins lying on the ground. War wounds are also likely to become infected with these germs. Our troops and many children today are protected against these germs by shots of tetanus toxoid, a substance made from the germ poison and treated so it will not cause harm but will stimulate body defenses against the germs.

Now scientists have found that a chemical produced by a micro-organism will neutralize the poison of the tetanus bacillus. This discovery was announced by Dr. Bruno Puetzer and Dr. Thomas C. Grubb of the research laboratories of the Vick Chemical Company at the meeting.

The chemical they used is named clavacin. It is produced by an organism isolated from manure. Use of an antibiotic drug to neutralize a germ poison is a new way to use these substances. Heretofore they have been used as remedies that checked the growth of germs in the body or killed them.

From the soil around potted plants in a greenhouse, University of Pennsylvania scientists have obtained two new anti-



biotics which show promise of developing into remedies against typhoid and paratyphoid fever, dysentery, cholera, anthrax and tuberculosis, and also of being active against organisms that cause rosy bread and much loss of foodstuffs thereby.

As remedies these antibiotics, known only as A-10 and A-105, have not progressed beyond the test-tube stage except for one disease. They have been tried with good results in laboratory animals as treatment for the pneumonia caused by Friedlander's bacillus, Drs. Albert Kelner, Walter Kocholaty, Renate Junowicz-Kocholaty and Harry E. Morton reported.

Especially encouraging is the fact that as chemists have purified these antibiotics more and more, their action against germs has increased but their toxic effect has not. It would take 50 times the remedial dose to cause toxic symptoms.

Bacteriologists are actively searching for new antibiotics because, as reported at this meeting, some germs develop resistance to streptomycin as well as to penicillin. When these drugs lose their power to cure a patient, it is hoped one of the newer ones may be ready to take over.

Eumycin, announced by Dr. Edwin A. Johnson and Kenneth L. Burdon of Baylor University College of Medicine, is another of these promising new antibiotics. It is active against diphtheria and tuberculosis germs and also against fungi such as cause athlete's foot.

Recovery from type three pneumonia and from anthrax was brought about in laboratory animals by still another new antibiotic, subtilin, Drs. A. J. Salle and Gregory Jann of the University of California reported. This very powerful drug had a definite suppressive effect on experimental tuberculosis in guinea pigs. Its remarkable safety is shown by the fact that it is 20 times more poisonous to staphylococcus germs than to chick heart tissue.

## Typhus from Pets

► A NEW HEALTH threat coming from the family pet dog or cat has been discovered by Dr. J. V. Irons, Miss Oleta Beck and Dr. J. N. Murphy, Jr., of the Texas State Health Department.

Fleas harboring typhus fever germs were found on five kittens intimately associated with five human cases of typhus fever. Fleas from rats have been known for some years as spreaders of typhus fever in this country. Now it appears

that the fleas on kittens and puppies can give the disease to their masters.

## Antibiotic from Saliva

► FUTURE SUPPLIES of a penicillin-like antibiotic drug may come from a germ found in human saliva if practical development can be made from a discovery reported by Dr. Richard Thompson and Madoka Shibuya of the University of Colorado School of Medicine at the meeting.

Green streptococci, ordinarily harmless germs, produce a substance that stops diphtheria germs from growing in the test tube. The presence of the streptococci in the mouth probably would not give protection against diphtheria since there are other substances in saliva that interfere with the antibiotic action.

If the material can be obtained from the saliva organisms, however, it might become another antibiotic remedy. That is a problem for future work, Dr. Thompson said.

Clue to the saliva antibiotic came from a German report of a germ-checking substance they had found in saliva and called inhibine. They thought it was like lysozyme, an anti-germ chemical in saliva, tears and other body fluids discovered by Sir Alexander Fleming years before he discovered penicillin.

The Colorado workers, following the German lead, were investigating saliva, trying to learn more about this germ-checking action, when they stumbled on the fact that it was the green streptococci in the saliva that were producing it.

## New Attack on Cancer

► FIRST STEPS toward a new line of attack on cancer were reported by Dr. Eveiy L. Oginsky and Dr. O. N. Allen of the University of Maryland and Dr. Hugh T. Creech of the Lankenau Hospital Research Institute and the Institute for Cancer Research, Philadelphia, at the meeting.

Still in the test tube stage, the work so far consists in linking cancer-causing coal tar chemicals with albumin from horse blood to see whether a vaccine against these coal tar chemicals could be developed. Vaccines or immunizing substances are usually made from germs that have been living organisms. Germs, even when they have been killed, can stimulate the body to produce antibodies to fight invasion of living disease germs. But the coal tar chemicals that cause

cancer in mice when painted on the animals' backs are inert materials that do not ordinarily stimulate antibody production.

When the coal tar chemicals were linked with horse or human blood albumin and then injected into rabbits, the rabbit blood was shown by test tube experiments to contain antibodies against the coal tar chemical injected and against cancer-causing chemicals of similar structure.

Whether that means that the coal tar-albumin material could be used to protect animals against coal-tar-caused cancer has not yet been determined, but the results so far, the researchers re-

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ported, "make desirable" further study of the possibility.

Coal tar chemicals in soot were believed to be the cause of a kind of cancer that attacks humans and was known as "chimneysweep's cancer." The chemical relationship between these cancer-

causing substances and other naturally occurring substances in the human body, such as the sex hormones, has led many scientists to hope for at least a partial solution of the cancer problem through studies of the coal tar cancers in animals.

*Science News Letter, June 1, 1946*

## HYDROPONICS

## Soilless Farms for Japan

**In Japan the world's largest soilless gardens are under construction to supply green salad vegetables for our occupation forces.**

► The world's biggest soilless gardens, where vegetables are raised in long beds of gravel on water solutions of fertilizer chemicals, are now under construction in Japan. Details of the gardens, which will supply green salad vegetables for our occupation forces, were disclosed by Lt. Col. Ewing Elliott of the Eighth Army, in charge of the project, who is in Washington for a short time, to arrange for further work.

Over-all area of the gardens (or perhaps farms would be the better word) is 80 acres, divided into two sections—55 acres at Chofu, near Tokyo, and 25 acres near Otsu, about six miles north of Kyoto. Each consists of a series of long, shallow concrete troughs, filled with washed river gravel, through which the solution of chemicals is flowed every two days, to maintain moisture and feed the plants.

In similar but much smaller gardens used during the war, tomatoes, lettuce, radishes, cucumbers and green peppers were grown successfully. To this basic five Col. Elliott expects now to add green onions, carrots and spinach for salad purposes. Japanese labor will be employed throughout; it is expected that 1,000 men will be kept busy raising greenstuffs for the American forces in Japan.

This method of producing vegetables was adopted for two reasons: Japanese methods of cultivation make it unsafe to eat any of their produce raw, and in any case Gen. MacArthur wants every acre of Japanese farm land devoted to the task of staving off famine among the Japs themselves.

Japanese agricultural scientists are very much interested in the project, seeing in it a possibility of increasing food production in their over-crowded country. The universities of Tokyo and Ky-

oto are cooperating, as well as the Ministry of Agriculture. Col. Elliott's principal assistant is Dr. Tyozaburo Tanaka, emeritus professor of horticulture at the Imperial University of Taihoku, Formosa. Fifty university graduate students have asked to be taken on as laborers, to get a chance to learn the technique.

Soilless gardening got its first large-scale try-out on barren Ascension island, just south of the equator in mid-Atlantic, where there was a large American airbase during the war. The area of this garden, however, was only two and one-half acres, as compared with the 80-acre installation in Japan.

One two-acre soilless garden is now in operation on Iwo Jima, and additional moderate-sized ones are planned for some of the other Pacific islands where American troops are stationed.

*Science News Letter, June 1, 1946*

## ENTOMOLOGY

## Spiders and Butterflies Wanted Wholesale

► IF YOU HAVE any tarantulas—really big, poisonous brutes, with all their legs attached—Ward's Natural Science Establishment in Rochester, N. Y., will make you an offer. This firm, pioneer in the business of supplying schools and colleges with specimens of all kinds, regularly does business with some 200 professional collectors of spiders, insects, and other many legged creeping things.

Ward's regularly issues a "desiderata"—a list of things they want. The current list requests wholesale lots of about 200 North American insects in all stages of development. Certain kinds of moths and butterflies are wanted in quantities of 100 or more.

*Science News Letter, June 1, 1946*

Wintergreen and chocolate top the list of preferences of spicy odors, a recent group test indicates.



**TARANTULA**—Close-up portrait of a tarantula, poisonous spider collected in the Southwest for Ward's Natural Science Establishment, Rochester, N. Y., suppliers of natural science specimens for educators and collectors. Only the biggest specimens are taken for the establishment's stock of over 400,000 insects.



## NUTRITION

# Pellagra Threat

**Faces the population of the Danube basin if they are forced to eat too much maize. Addition of niacin to bread may prevent this.**

► A NEW NUTRITIONAL worry on top of all the food shortages appears in FAO plans for feeding the world next year. The worry is that pellagra, hard times disease of our own southern states, may strike the population of the Danube basin.

FAO estimates that continental Europe outside the USSR will in 1946-1947 produce enough food to supply about 2100 calories daily per person. These estimates, however, are based on three conditions, including the one that in the Danube basin humans consume much more maize, or corn, than before the war.

Pellagra has always occurred in regions where the staple cereal is corn or maize, instead of wheat or rice. At one time it was thought there was something in maize that caused pellagra. Now it appears that it is a lack of something in corn, specifically the amino acid, tryptophane, that causes the pellagra in persons relying on corn for their staple food.

Pellagra, as was discovered some years ago, can be both cured and prevented by a vitamin called niacin or nicotinic acid. People in the Danube basin can eat more maize, to help the world food situation, and still escape pellagra if they get additional amounts of this vitamin. The vitamin could be added to their bread and other foods made from corn, as we now add it to our bread made from wheat. Medical and health authorities, knowing the danger, can be on the alert to detect early signs of pellagra and give the necessary vitamin to cure it.

The relation between tryptophane, an amino acid which is one of the building blocks of protein, and the vitamin, niacin, has only recently come to light. The late Dr. Joseph Goldberger of the U. S. Public Health Service, who discovered the way to prevent and cure pellagra, first thought the cause of the disease was lack of a protein or amino acid in protein. He abandoned this idea when he found the pellagra-preventing factor or vitamin, as it was then called. It was much later that this vitamin was identi-

fied as the chemical, nicotinic acid.

This identification of the vitamin came from the discovery of Prof. C. A. Elvehjem at the University of Wisconsin that nicotinic acid cured and prevented black-tongue in dogs, a condition which is the canine counterpart of pellagra in man. It is Dr. Elvehjem who has given us the latest information on pellagra and diet, the relation between tryptophane and nicotinic acid or niacin. Since he is not a physician, his findings come from studies of laboratory animals.

Rats, he has discovered, fail to grow when fed a diet consisting chiefly of maize. The growth failure can be cured, however, with either tryptophane or nicotinic acid. Other scientists have found that animals fail to grow on any diet containing a lot of protein of a kind that is low in tryptophane as corn protein is. The reason for this has not yet been learned, though many scientists are now working on that phase of the problem.

*Science News Letter, June 1, 1946*

## ASTRONOMY-PHYSICS

## Artificial Meteor Showers from V-2 Rocket

► SCIENTISTS are planning to pepper the earth with an artificial shower of meteorites launched into the ionosphere from some of the other V-2 rockets to be fired this summer.

A variety of small pellets believed to be the equivalent of "stones from outer space" will be placed in the head of the giant rocket and flung out from it at about 75 miles above the earth. An artificial shower of "shooting stars" will result.

Observed by astronomical photographic telescopes and possibly tracked by special radar sets, the synthetic meteor shower thus created is expected to tell scientists about the action and the composition of natural meteorites at that high altitude. The light given off by the meteorites from outer space will be compared with the light created by the similar friction-heating of the artificial ones as they rush into the atmosphere.

The Army's ordnance experts are as in-

terested as astronomers, physicists, and meteorologists in such prospective tests because any information about just what is contained in space beyond the reach of sounding balloons will prove practically useful as effective ranges for military rockets increase beyond the 250 miles of the present V-2.

Scientists cooperating with the Army have not yet solved the problem of ejecting from the rocket in full flight scientific instruments carrying with them records of observations. First hope was to place instruments in armored spheres that would withstand the terrific impact when the rocket returns to earth. But test spheres in the first rocket were not recovered from the crater about 20 feet deep and 25 feet across. So work is being begun on some method of dropping off the instruments before the rocket as a whole gets back to earth.

Parachutes won't help because there is not enough air to open and float them.

*Science News Letter, June 1, 1946*

## MEDICINE

## BAL Has Now Been Released to Physicians

► BAL, LIFE-SAVING drug for victims of bichloride of mercury and arsenic poisoning, is now available to physicians generally. Prior to release by the U. S. Food and Drug Administration it was available only to a small group who were testing its value and determining best methods of use.

The drug was developed by British scientists to combat the war gas, Lewisite. Its name comes from the initials for British anti-lewisite. Much of the research that developed it into a remedy for mercury and arsenic poisoning was done by medical scientists of the Chemical Warfare Service at Edgewood Arsenal, Md., and civilian physicians working with them.

The very existence of the drug was a closely guarded secret during the war. First public announcement was made late in 1945.

Even now, the drug will be available only to physicians and must be used only by prescription and under a doctor's care. It is being manufactured, in the form of ampules to be swallowed, by Hynson, Westcott and Dunning of Baltimore.

*Science News Letter, June 1, 1946*

*Sleepwalking* is an attempt to obtain protection from a threatening environment and represents a flight to security.

## MEDICINE

# Mental Causes for Ills

**Psychotherapy recommended for large number of medical patients suffering from organic disturbances caused by emotional strain.**

► TO THE VERY large number of persons throughout the nation who are suffering from mental disorder and need psychiatric treatment must be added many more whose heart trouble, stomach trouble and even rheumatism result from upset and conflicting feelings and thoughts, it appears from discussions at the meeting of the American Society for Research in Psychosomatic Problems in New York.

These people, who may make up as many as half the patients diagnosed as having heart disease or other organic disease, also need psychotherapy, as hundreds of doctors found while serving as medical officers during the war.

Some idea of the size of the problem can be gained from figures reported by Brig. Gen. William C. Menninger.

In 11 Army general hospitals in the zone of the interior a survey by specialists in internal medicine showed that 24.2% of the patients in wards for heart and blood vessel disease and 20.7% of the patients in wards for stomach and intestinal disease had what doctors call functional disorders. This means there is nothing wrong with the heart or other organ but it is not working properly because of the upset emotions.

At station hospitals, almost half, 41%, of the heart patients and 30% of the stomach and intestinal disease patients belonged in this group who had functional disorders.

The figures would have been even higher, Gen. Menninger said, if the surveys had been made by or with a psychiatrist.

The types of organic diseases from which these men suffered are no different, he said, from those in civilian life.

"It is intriguing to speculate," he said, "why so many physicians are blind to the emotional factors in disease."

Medical education is not entirely to blame, he added.

Telling the general practitioner that all these patients must be sent to psychiatrists will not help solve the problem, Dr. Roy Grinker, of Chicago, said. It will only alienate the doctors who are not

psychiatrists and there are not enough of the latter to handle all the patients anyway.

The need is for some method by which the general practitioner can himself treat the emotional problems of these patients, although he will have to give them more than one brief interview a week.

He reported success with a method of "brief psychotherapy," although he pointed out that it is not really brief, merely briefer than the usual methods. It consists in giving the patient a drug, sodium pentothal. Under its influence the patient will speak more freely than otherwise and the psychiatrist can learn more quickly the underlying emotional disturbance. Treatment may be reduced from months to weeks.

This quicker treatment, however, speeds up recovery only when the disturbance results from a situation, as in war. In that case there is some hope of changing the situation to aid the patient's recovery. If the trouble, however, results from the patient having developed as a small child a faulty attitude toward life, the treatment will be long since it involves re-educating him.

*Science News Letter, June 1, 1946*

There are now 22 giant *tortoises* at the Bronx Zoo, of which 18 came originally from the Galapagos islands on the equator west of South America, and three from Aldabra island off the coast of Africa.

Long stalks of *asparagus* can be cooked tender their entire length if stood loosely in boiling water in the bottom section of a double boiler, with the upper section inverted to cover the tips; the steam cooks the tips.

*Silk gut* used for fishing tackle is obtained from the silk glands of an insect closely related to the silkworm.



*Joint Army-Navy Task Force One photograph.*

**SETTLING DOWN ON RONGERIK**—There's no housing shortage for King Juda and his Bikini subjects on their new island of Rongerik in the Marshalls. All native inhabitants were moved from Bikini Atoll by the American government to make way for the atomic bomb test. Rongerik was uninhabited when the move was initiated (See p. 347).



## PHOTOGRAPHY

**To Take Photo Story of Bomb Test in Pacific**

► BEFORE, DURING and after the atomic bombing of Navy ships at Bikini Atoll in the Pacific, movie, television and still shot cameras will be grinding out a complete picture of this greatest show in history.

An aerial record of the bombing will be made from cameras mounted in planes such as the Boeing F-13 photo ship shown in the Joint Army-Navy photo on the cover of this SCIENCE NEWS LETTER. Four photographic planes will be flown in the different quadrants out from the explosion to "shoot" the bombing from 20 seconds before to six minutes after the bomb is dropped. Supporting these photo aircraft will be four planes standing by in event of casualties.

The F-13 flying camera ship is a converted B-29 with two ultra-high-speed cameras mounted in four turrets. In addition, an observer in the tail position will operate motion picture and still cameras.

*Science News Letter, June 1, 1946*

## MEDICINE

**Streptomycin Dosage Must Be Right If Effective**

► A NEW WORRY over streptomycin, that it may kill rather than cure if the dose is not just right, appears in findings by Drs. Henry Welch, C. W. Price and W. A. Randall, of the U. S. Food and Drug Administration.

When the antibiotic was given at certain dosage levels to mice with typhoid fever, more of the animals died than would have if they had not been given streptomycin.

Although these findings were made on mice, "there is no adequate reason" why this should not also occur in man, the scientists state in their report. (*Journal, American Pharmaceutical Association, May*).

The dosage levels that stimulated the typhoid germs to greater deadliness are the ones usually found in the blood of humans at some time during streptomycin treatment.

Alarming as the findings are, they also hold hope that streptomycin treatment may succeed in more diseases than it does at present. The drug kills the germs of typhoid fever and undulant fever in the test tube, for example, but when used to treat the disease, some patients

recover while others do not. Changing the dosage and treatment schedules in the light of these new findings may bring success in more cases treated.

Discovery came about through puzzling inconsistencies in results from routine test tube experiments on streptomycin, a drug closely related to streptomycin. Laboratory workers observed that relatively high concentrations of the drug did not interfere with the activity of germs as much as somewhat lower concentrations did. Substituting streptomycin for streptothricin, and using typhoid organisms for the test, they obtained essentially the same results.

Why streptomycin within a relatively narrow range of dosage, can either stimulate germs to greater deadliness or overpower them has not yet been determined.

*Science News Letter, June 1, 1946*

## MEDICINE

**New Chemical Effectively Treats Scrub Typhus**

► SCRUB TYPHUS, one of the severest diseases encountered by U. S. troops in the Pacific and Asia, can be successfully treated with a chemical, para-aminobenzoic acid, the War Department's U.S.A. Typhus Commission makes known in a recent report (*Journal, American Medical Association, May 25*).

Until carefully controlled clinical tests made by Lieut. Nicholas A. Tierney, Navy surgeon, at Assam, India, demonstrated that the drug in large doses is "an effective therapeutic agent" for tsutsugamushi disease, no successful treatment had been known.

In the test conducted during the building of the Ledo Road through jungle territory where the mites that carry the disease are plentiful, one patient received at the hospital was given PABA, as the drug is called for short, while the next patient was given the best standard treatment without the chemical. In this way 18 patients were given the new treatment and compared with 16 who did not receive it.

Three of the control cases died, while none of the cases treated with para-aminobenzoic acid were fatal. Patients who were given the chemical had fewer days of fever, less severe symptoms and complicating symptoms and a shorter convalescence period. Lieut. Tierney emphasized that the chemical should be administered in the first week of the disease.

*Science News Letter, June 1, 1946*

**IN SCIENCE**

## PHYSICS

**Atomic Science May Be Applied to Glass**

► AN EXTENSIVE research program to apply findings of wartime atomic science to glass technology is proposed. This is a recommendation of the glass division of the American Ceramic Society.

Dr. Alexander Silverman of the University of Pittsburgh, chairman of the research committee, states that there now is possible a radioactive form of each of the chemical elements.

Those employed in glass manufacture, he says, would tell how raw materials melt, how the glass flows during melting, where the materials are located in the finished glass, and might account for defects in imperfect glass. Some of the newer elements will produce glasses possessing new properties and colors, he adds.

The proposal includes the collection and distribution of funds for glass research in educational and industrial research laboratories throughout America to keep this country in the forefront in glass technology and manufacture.

*Science News Letter, June 1, 1946*

## PHYSICS

**300-Mile Oceanic Layer Reflects Sound Waves**

► SOUND WAVES sent into the Pacific Ocean off the coast of California by Navy sonar devices will bounce back from 1,000 to 1,500 feet below the surface when they strike a 300-mile wide oceanic layer suspended between the floor of the ocean and the surface, scientists at the Navy Electronics Laboratory of the University of California Division of War Research have reported.

This sound-stopping layer extends from Point Mendocino, 200 miles north of San Francisco, to Cape San Lucas at the tip of Lower California, and is the deepest oceanic layer known.

Scientists are not sure what composes the layer, but one theory is that plankton, small marine animals, make up the sound barrier. Other suggestions are that the echo may be caused by larger fish feeding on plankton or that gas bubbles from the undersea life reverberate sound.

*Science News Letter, June 1, 1946*



# SCIENCE FIELDS

## ACOUSTICS

### New Instrument Aids Deaf To Use Telephone

► **DEAF PEOPLE** will be able to carry on a telephone conversation with a new instrument demonstrated to the Acoustical Society of America. It is called a sound spectrograph and translates any sound into a visual pattern. With a little training, deaf persons can learn to read the patterns and literally see what the other party has to say.

Drs. W. Koenig, H. K. Dunn, and L. Y. Lacy of the Bell Telephone Laboratories, inventors of the spectrograph, explained that the new instrument would be used first for the rapid and accurate analysis of sound. It is a wave analyzer that produces a permanent visual record of the sound's energy distribution in both frequency and time.

Another session of the acoustical meeting learned that "silent as a fish" is an obsolete expression. Drs. Donald P. Love and Don A. Proudfoot of Columbia University declared that the croaker, among other fish, can make a noise that, if it were in air, "would compare favorably with a boiler factory."

Noisy fish became important during the war when their sounds threatened to interfere with the detection of enemy submarines.

*Science News Letter, June 1, 1946*

## NUTRITION

### Vitamin B Complex for Starving Populations

► **AN INCREASE** in the food supplies of the war-ravaged nations of Europe and Asia can be achieved simply by feeding vitamin B complex to the starving populations.

This was suggested at a meeting of the American Gastro-Enterological Association by Dr. T. L. Althausen, associate professor of medicine in the University of California Medical School.

Dr. Althausen reported significant new experiments with animals in which it was shown that maximum utilization of foods can be obtained only if there is an adequate supply of vitamin B complex.

Stating that there is a significant in-

crease in food utilization in rats recovering from a deficiency after administration of the B complex, Dr. Althausen said that no single component of the complex was alone responsible for the increase. While vitamin B<sub>1</sub>, or thiamin chloride, made the most marked difference, the lack of any one decreased food utilization.

Dr. Althausen said that the administration of the B complex also causes an increased intestinal absorption of glucose, a sugar which contributes to gain in body weight.

Failure to insure that deficient persons are given an adequate supply of all the B complex vitamins in effect results in a waste of food, since it will not be utilized to the maximum.

"Another reason for supplying under the present conditions in devastated countries adequate amounts of vitamin B complex which apparently acts as added food by increasing the efficiency of utilization of available food is its small bulk and low cost," Dr. Althausen stated.

Dr. Althausen's report was prepared in collaboration with Dr. John J. Eiler, associate professor of pharmacy and biochemistry, and Mabel Stockholm, researcher.

*Science News Letter, June 1, 1946*

## PHOTOGRAPHY

### Built-In Flash-Blub Holder For Small Camera

► **A SMALL CAMERA** with built-in flash-bulb holder, designed especially for photographing small objects at a few inches' distance, is the invention on which U. S. patent 2,400,483 has just been granted to William J. Cameron of Chicago.

For finding and focussing, a prism is inserted between the lens and the shutter, to throw the image upward to a second reflecting prism, which in turn directs it backward to the eye of the operator. He is thus able to see exactly what he is going to photograph.

When the operator is ready to make his exposure, he moves a lever that lifts the prism out of the way, and at the same time opens the shutter. Simultaneously, the flash-bulb is fired. Then the shutter closes.

The flash-bulb is set into a cylindrical housing beneath the lens barrel, so that it throws its light directly on the object. In front of the bulb is an adjustable

diaphragm, so that the amount of light can be controlled at the operator's will. The battery is contained in a downward-projecting cylinder, which also serves as a convenient handle.

The inventor states that the camera was designed especially for the use of physicians, surgeons and dentists; but its application in many other fields is obvious.

*Science News Letter, June 1, 1946*

## PHYSICS

### Muzzle Attachment Eliminates Gun Flash

► **OPTICAL METHODS** of studying air streams travelling faster than sound led to the development of a device to eliminate the telltale muzzle flash of a soldier's gun.

The same methods now have an application in airplane design, particularly in the development of craft for supersonic speeds and of efficient orifices for jet propulsion.

The actual elimination of the flash from a discharging gun is due to a muzzle attachment which changes the flow of exploding gases from small caliber arms, but the device is a result of laboratory studies of gases escaping at high pressure from tubes, made possible by the special optical methods.

These optical methods, developed during the war, result from work done at Princeton University by Dr. Rudolf W. Ladenburg, Dr. Cletus C. Van Voorhis and Dr. John R. Winckler. After a beginning had been made, the U. S. Navy became interested and all later work was done under a Navy Ordnance contract.

In carrying out the study of muzzle flash, what scientists call the interferometric technique was used. This employs light rays as a means of measurement. It is an advance over mechanical measurement devices because these cause deformation of the gas stream.

The methods developed here are based on earlier work. The noted physicist Albert A. Michelson demonstrated 60 years ago how light rays might be used to study optical effects in gases. Austrian and German physicists had applied optical methods to the study of supersonic phenomena. No one in this country or in England had ever used an interferometer for studying the behavior of supersonic air streams flowing around objects when the war work was begun at Princeton.

*Science News Letter, June 1, 1946*

GEOGRAPHY

# Geographical Guinea Pig

Scientists from all fields will study results of the atomic bomb test at Bikini on land, in the sea and in the air for many years to come.

By MARTHA G. MORROW

► BIKINI ATOLL, one of the least known island groups in the world until the proposed atomic bomb tests brought it into the limelight, by the end of June will have been as thoroughly scrutinized as any spot on earth. Plants and animals on the island, fish in the lagoon and surrounding ocean, geological formation of the island itself, wind and currents—all are being extensively surveyed prior to the atomic bomb tests to be held during the coming summer.

Until a year or two ago little was known about these palm-covered bits of land in the atoll. The only detailed maps of the region were those captured from the Japanese. Vessels that might have brought back reports on the atoll and surrounding waters were forbidden to

go near this or any other atoll of the Jap-mandated Marshalls group.

To biologists these atomic tests, which will drastically reduce all life in the area, offer an ideal man-made opportunity to study how new life is introduced to a region. After the test, biologists will return periodically to explore the possibility of life having survived the explosion and to study new types of life as they appear on the atoll. But first they must know what life exists there today, so the snails, clams, crabs, lizards, lagoon fish, terns and frigate birds are being carefully catalogued.

Not only is Bikini being thoroughly investigated, but neighboring atolls as well. Currents in this region flow in the direction of the Philippine Islands and Asia. Thus Eniwetok atoll, which is down current and might possibly be contami-

nated by powerful radiations due to the explosion of the atomic bomb, and Rongerik atoll, which is up current and probably won't be contaminated, are both being scrutinized.

The worst that could happen is that every animal on the island will be killed. Then if larvae from neighboring islands could not survive the long trip, life there would fail to return to the island afterward unless imported by man. On the other hand, if some animals survive the terrific explosions of these devastating bombs, new species due to the powerful radiations may develop. Certainly if a new type of life is begun, scientists want to be present at its birth.

The soil on Bikini is generally too poor for agriculture. Coconut palms are about the only trees, but there are also some pandanus, breadfruit and papaya. Among food plants, arrowroot is of considerable importance; taro and yams are somewhat less common. A strip of scaevola bushes generally grows as a mangrove thicket along the water's edge. The extent of damage to plant life and how long it takes for the island to regain its vegetation will be determined by precise and long-continued surveys.

When the atomic bomb bursts over Bikini atoll, a lot of fish will undoubtedly be killed. Marine biologists, with the assistance of a corps of expert fishermen, will study the effect of the explosion on fish inshore, in the lagoon and in the open ocean. Reef fish, upon which the natives lived, are expected to suffer, but life in the open ocean probably won't be affected much.

Early objections to the bombing experiments, on the score of possible material harm to commercial fisheries and the whaling industry, have been overcome by the selection of Bikini atoll as the site. The fish here, though abundant enough, are too far from any possible market to be of economic significance, and the little coral island is remote from all known paths of whale migration.

To study where water containing the radiant materials will drift, a contamination survey is being planned. Tests will show the amount of radiation in the water near the atoll and also some distance from it. This will help determine how soon people can safely return to the region. The irradiated particles will also show the path followed by the ocean



Joint Army-Navy Task Force One photograph.

**BULLSEYE FOR ATOMIC BOMB**—Glistening in her new bright orange-red paint is the USS Nevada which is to be the center target for the joint Army-Navy atom bomb test at Bikini. First of the Navy's oil-burning super-dreadnaughts, the Nevada is a veteran of 30 years' service. Although now declared obsolete, the splendid lines which made her famous are still unspoiled.



currents in this region, concerning which little is known at present.

There are over 20 islands in the atoll, of which Bikini is the principal one. This coral ring, 21½ miles long, is about 2100 miles from Honolulu and 2450 from Yokohama. The 167 men, women and children living on the island, of Melanesian and Chamorro extraction, consented to be moved to a previously uninhabited island 109 miles east, in the Rongerik atoll.

### Atoll of Live Corals

An atoll is formed from a bed of live coral which is thought by some scientists to have been built upward gradually from submerged mountain peaks that at some time in the geological past rose close to the surface of the sea. Presumably because the coral polyps at the edges of the bed, and particularly to windward, receive more food, they build more rapidly and form an irregularly circular reef of live coral surrounding a shallow lagoon. The maximum depth of the Bikini lagoon is about 200 feet. The bottom is flat and sandy except where cones of live coral rise to or near the surface.

By breaking off fragments of coral and carrying them inward, the waves have created islands here and there around the reef. Elsewhere the reef, typical of atolls, rises only to or near the surface of the sea at high tide, and is broken at one or more places by passages through which the tides flow to and from the lagoon.

Geologists hope to find the depth of the coral layer through the atomic bomb explosion and to determine definitely whether the peak upon which the atoll is built is of volcanic origin. After an explosion has been set off, much can be told concerning the type of material through which the vibrations travel by clocking the time needed for them to be "echoed" back to the surface by the various layers.

Waves near the explosion are expected to be several scores of feet high but the

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## WYOMING

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**PATON RANCH, SHELL, WYOMING**

wave height will rapidly decrease much like the height of ripples when a pebble is dropped into a pond. Thus, the waves will probably not break over any of the islands in the atoll even though the highest point on any of these is only about ten feet. "Wave people" are on the scene to measure the height, wavelength, and speed of the waves with instruments, cameras, echo-sounding machines, and television.

Unanswered questions include how such waves would act and how much surrounding islands would interfere with their normal course. All the instruments set up to measure the waves are remote-controlled so that the people in charge will be a long, long way off.

### Participating Agencies

A number of institutions are taking part in this scientific survey. They include the U. S. Navy Hydrographic Office, the Woods Hole Oceanographic Institution, U. S. National Museum, the Fish and Wildlife Service of the U. S. Department of the Interior, the U. S. Geological Survey, and the U. S. Coast and Geodetic Survey. The University of California through its College of Engineering and the Scripps Institution of Oceanography, the University of Southern California and the University of Michigan will also be represented. The U. S. Navy Electronics Laboratory at San Diego, the Geotechnical Corporation of Boston, the U. S. Navy Mine Warfare Test Station at Solomon's Island, Maryland, and the Bureau of Ships of the Navy Department will also cooperate in the study.

Two ships belonging to the U. S. Navy's Hydrographic Office are on the scene. Complete floating laboratories, the *USS Sumner* and the *USS Bowditch*, include all the equipment necessary to survey the area, test ocean currents, take the temperature of the water, identify material on the ocean bottom and study weather conditions. Both are stocked with all the apparatus needed to design and print maps on the scene. In addition, six smaller ships are being employed.

As this area will probably be the center of scientific investigation for years to come, the results of these surveys will be coordinated and published by the newly-established Division of Oceanography of the Hydrographic Office, so that all known information on this closely-scrutinized geographical guinea pig will be available.

### INVENTION

## Electric-Eyed Machine "Inspects" Plants

► A HOEING MACHINE, designed for thinning and weeding operations in such crops as sugar beets and cotton, "inspects" the plants with an electric eye before it chops out weaklings and weeds, sparing the stronger, more promising specimens. It is the invention of Leo A. Marihart of Monterey County, Calif., who has just been granted U. S. patent 2,400,562 on the device.

Mechanical cotton-choppers and beet-thinners have been invented, but they have the weakness of being entirely mechanical. They knock out predetermined spaces in the rows of young plants, and it is a matter of chance if they spare the right ones.

In Mr. Marihart's invention there is a revolving set of blades that block out whole segments of the line. Following after it, however, is another set of blades whose action is intermittent; they swing round and clip out finer bites of soil and roots only at the bidding of photocells that "look" at each plant through light filters and "decide" whether it is a weed or a desirable citizen of the crop community.

Science News Letter, June 1, 1946

## SECRETS OF INDUSTRY

BY LEWIS C. ORD

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Science News Letter, June 1, 1946



## Do You Know?

Approximately 20,000 species of trees in the world have economic value.

*Agricultural production* in continental Europe in the World War I period reached its lowest in 1919, the year after the armistice; it was about 25% below normal.

*Scale insects* fasten themselves to the surface of a plant, cover themselves with wax, and remain at the one spot for the rest of their lives.

A *white powdery product* of sand, recently developed, gives rubber compounds the same qualities obtained through the use of carbon-black; with the new material rubber overshoes need no longer be black.

*Gizzards* in birds, in which the food swallowed is ground up, working in conjunction with powerful gastric juices, perform amazing feats; sea ducks, for example, swallow whole crustaceans, and reduce the shells to fine sand.

*Non-alcoholic beverage* is made in Germany from sugar beets; the beets are steamed in an autoclave for 15 minutes under one-half atmosphere pressure, then the juice is squeezed out in a cider press, filtered, bottled and carbonated.

## YOUR HAIR AND ITS CARE

By O. L. Levin, M. D. and H. T. Behrman, M. D.

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### AERONAUTICS

## Safe All-Weather Flights

More important at present than economy, the development of speed or any other factor in air transport are safe instruments for blind flying.

► ALL-WEATHER FLYING that will bring regularity in service is needed for air transport development more than greater speed or economy, Dr. Edward Warner, president of the Interim Council of the Provisional International Civil Aviation Organization, told the George Westinghouse Centennial Forum in Pittsburgh.

More than half of the improvements in air transport that will be brought about by science and technology in the next ten years will lie in the development of navigational aids and blind landing systems that will permit flying under all weather conditions, Dr. Warner declared.

Some system of instrument landing, however far from perfect, must be adopted immediately, he said. Present radio approach methods, designed only to bring the pilot to the edge of the airport, have brought no substantial change in the worst allowable weather conditions under which flights may be authorized.

Experimental blind landing systems have been used with almost perfect results in military operations, permitting flights in all but the most violent thunderstorms and icing conditions, Dr. Warner continued. It will be the job of the PIACO during the coming summer to make a choice from the available systems and to obtain its international acceptance.

Control of the rapidly mounting traffic at airports continues the outstanding problem still demanding solution. Dr. Warner predicted that it may be found in some form of search radar system to be installed in each aircraft. Such a device will enable the pilot to tell at a glance the position, direction and speed of neighboring planes so that he can land, when flying blind, with the same certainty and safety as under conditions of perfect visibility.

The first general assembly of the PIACO met May 21, 1946, in Montreal, and the work will continue throughout the summer. The 44 nations that are now active members will tackle these problems. In addition, Dr. Warner said, the representatives of the 44 nations will try to remove other obstacles in the way

of free international air transportation.

They will adopt an international air line operation code designed to bring about a minimum of delay and inconveniences to air travellers arising out of numerous visa, passport, and customs regulations. Proposals have been made for all nations to grant six-month visas, not to require a separate visa for each entry, to exempt aircraft in transit from inspections, and to give crews and passengers assistance in the event of unscheduled emergency landings.

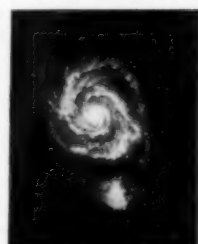
International agreement on all these points is needed because during the next summer the airlines of six nations will be maintaining regular trans-Atlantic service. More than this number of nations have already established operations between England and the continent of Europe, Dr. Warner reported.

In the United States alone, statistical records show an increase between 1935 and 1945 of 1200% in passenger traffic, as much as 1800% in express, and 1500% in mail carried by our air lines, Dr. Warner pointed out. He predicted that about 50,000 people will cross the Atlantic by air this year, and from two to three times that number during 1947.

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the Forum by Vice Admiral Emory S. Land, former Maritime Commission chairman and now Air Transport Association President, comes into effect.

One of the freedoms under the United Nations should be the freedom of travel, Adm. Land said. As a first step, he advocated the adoption of one simple form of passenger identification, and one equally simple form of property bill of lading for all nations of the western hemisphere. This, should eventually be extended to all members of the United Nations.

With relaxation of restrictive laws and regulations, he predicted the possibility of a large peace-time merchant fleet of from 15,000,000 to 20,000,000 tons, of which 7,500,000 tons would be for foreign trade.

Our foreign trade should amount to approximately \$10,000,000,000 yearly, Adm. Land predicted. This will generate 3,000,000 jobs in industry alone, in addition to absorbing the output of 1,000,000 people engaged in agriculture.

### Influence of Helicopters

Helicopters in our backyards may have as great an effect on our cities as the automobile; how much is still largely a matter of speculation, Harland Bartholomew, Planning Director of the St. Louis Regional Planning Association, declared at the Forum.

The rapidly increasing volume of air transport, however, is already showing its effect on our cities in the need for the construction of many different types of air terminals, he added. The number of aircraft will increase from a prewar total of 25,000 to approximately 400,000 by 1950.

In our large urban areas there will be one or more major fields for scheduled main-line-passenger, mail, and express traffic, and separate fields for scheduled trunk-line freight service and feeder lines.

Secondary fields will serve commercial and chartered service, there will be numerous minor landing strips for private industrial use, privately owned personal planes, and schools, besides airports for military use.

Mr. Bartholomew predicted a comeback of the street-car. The old-fashioned trolley, with modern design changes, is still the most efficient transport unit for areas of moderately high population density. The trolley coach is expected to be introduced into a number of cities where its flexibility and absence of tracks are major factors.

*Science News Letter, June 1, 1946*

#### SEISMOLOGY

### Path of Tidal Wave May Be Forecast

► WHEN ANOTHER earthquake on the ocean bottom produces a tidal wave, the destructive ocean sweep's arrival on any neighboring coasts may be more accurately forecast because of records kept of the Alaska wave that recently brought death and destruction to Hawaii.

Although submarine earthquakes rarely produce the destructive waves, records of tide stations at more than a score of points in the Pacific are being analyzed by the division of tides and currents of the Coast and Geodetic Survey to trace the course of the unusual wave that did develop in the Pacific. Records showing the exact time at which the tide gauges picked up the oscillations from the wave have been gathered from stations extending from Alaska to Chile and including such outlying points as Honolulu.

In predicting the wave that swept out of Alaska, scientists of Coast and Geodetic Survey fixed the time of arrival in Hawaiian waters within four minutes of the actual recorded time, it was reported. The readings show that the wave was not one long movement, but rather a series of sharp thrusts.

Reaching a top speed of about 600 miles per hour, the wave averaged 500 miles per hour in its fateful dash from the epicenter of the disturbance in Alaskan waters to Hawaii.

Despite the tremendous speed of the wave as it struck land, Coast and Geodetic Survey officials say that it lost speed near shore because of the shallower depth.

Records kept by a tide station at Valparaiso, Chile, 8,000 miles from the epicenter, revealed as marked oscillations as instruments at Honolulu, 2,300 miles from the origin of the wave.

Standard tide gauges maintained by the Coast Survey operate automatically and record tidal movements on a wide paper tape. Throughout the Pacific, the recent tidal wave was marked distinctly by most of these instruments.

*Science News Letter, June 1, 1946*

#### CHEMISTRY

### New Kind of Mold Used in Citric Acid Production

► CITRIC ACID, heavily used in soft drinks, confectionery and medicines, is nowadays produced mainly by mold fermentation. An improvement in this process is the subject of U. S. patent 2,400,143 which has been issued to Prof. Selman Waksman, of Rutgers University, best known as discoverer of streptomycin and pioneer investigator of antibiotics generally.

One difficulty that has beset mold production of this acid is that the mold culture also produces oxalic and gluconic acids at the same time, necessitating costly separation processes. Prof. Waksman uses a different species of the *Aspergillus* mold from that commonly employed, and conditions the sugar solution on which it feeds with salts of iron and zinc. He states that in this way he is able to obtain an output of practically pure citric acid.

Rights in his patent are assigned to Merck and Company, Inc.

*Science News Letter, June 1, 1946*

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### 'Teen-Age Insects

► THIS WEEK is the big week for "17-year locusts." In parts of the Midwest and Southwest, big, brown, shiny-winged insects are swarming by billions out of holes in the ground and making the air dizzy with their song.

There is no need, though, to fear for our precious crops. They aren't really locusts—that name somehow got stuck to them by mistake. Their real name is cicadas.

Although they all look alike, there are two kinds of them. A dense brood is emerging all over central and southern Iowa. These belong to the 17-year cicada, which is the northern species. The southern species, which is swarming from Missouri and central Illinois south through Arkansas and thence eastward to the Carolinas, are 13-year cicadas.

They will hang around for a month or six weeks, singing, mating and depositing their eggs in the soft bark of young tree twigs. Then they will all die, and nothing more will be seen of them until the end of their respective 17-year and 13-year cycles. During all that time the young that hatch from the eggs and drop to the ground will be living in subterranean burrows, sucking sap from roots. With this strange existence of many years underground and a few weeks of sunlight and song, they are the longest-lived of known insects.

Scary folk will see an omen of coming war in the bright orange "W" formed by a junction of veins on each wing. But that "W" always appears, whether the world is at war or peace.

*Science News Letter, June 1, 1946*

About 3% of the deaf have a deaf parent.

### BIOCHEMISTRY

## Riboflavin Needed for High Altitude Living

► THE BODY cannot adjust to conditions of high altitude without an adequate supply of riboflavin, or vitamin B<sub>2</sub>, it is indicated in experiments at the University of California, which also provide further evidence that this vitamin is essential in carbohydrate metabolism.

If the body has a sufficient supply of riboflavin it makes an unusual adjustment to the low pressure of high altitude. The body burns up carbohydrates faster to do the job ordinarily done by a normal supply of oxygen at sea level.

Dr. Agnes Fay Morgan, noted nutritionist and professor of home economics, and Mary Wickson, researcher, found that in riboflavin-deficient rats this adjustment to an increased consumption of carbohydrates is not made.

However, if injections of riboflavin are given the deficient rats just before exposure to high altitudes, the adjustment is almost normal. The work indicates that persons flying at high altitudes be given adequate supplies of riboflavin. While the research was done to aid in combat warfare, it is also applicable to peacetime flying.

Dr. Morgan said also that the results may indicate that persons living in mountainous areas at high altitudes may need extra supplies of riboflavin to insure an increased carbohydrate metabolism to compensate for a decreased supply of oxygen in the air.

*Science News Letter, June 1, 1946*

### GENERAL SCIENCE

## Young Scientists Were Not Drafted in Russia

► RAPID ADVANCE of Soviet research which "threatens America's leadership in science" is due largely to the ample supply of young Russian scientists who were not drafted into the armed services even during the war, Dr. I. M. Kolthoff, University of Minnesota chemistry professor, charged in a speech before the American Chemical Society Delaware section.

America will have to pay a high price for the short-sighted policy of drafting our present generation of young scientists into the armed forces, Dr. Kolthoff declared, basing his opinion on observations during a scientific trip to Russia last year.

*Science News Letter, June 1, 1946*

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# Books of the Week

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**THE BUSINESS LAW OF AVIATION**—Gerald O. Dykstra and Lillian G. Dykstra—McGraw-Hill, 532 p., \$5. A combined text and case book in aviation law, presenting a convenient compilation of the leading court decisions which have involved some aspects of aviation, and calling attention to the federal and state statutes which govern this field of business.

**A CHRONOLOGICAL HISTORY OF ELECTRICAL DEVELOPMENT**—National Electrical Manufacturers Assn., 106 p., \$2. The story, by dates, of electricity and the vast assortment of devices and equipment created by the electrical manufacturing industry to utilize it.

**COMISION IMPULSORA Y COORDINADORA DE LA INVESTIGACION CIENTIFICA: Anuario 1944**—Comision Impulsora y Coordinadora de la Investigacion Cientifica, 405 p., tables and illus., paper, free.

**THE COOPERATIVE WAY: A Method of World Reconstruction**—James Peter Warbasse—Barnes & Noble, 184 p., illus., \$2. An examination of the possibilities for

enduring peace and mutual aid, and of the consumer cooperative as a means of realizing this end.

**COUNSELING TECHNIQUES IN ADULT EDUCATION**—Paul E. Klein and Ruth E. Moffitt—McGraw-Hill, 185 p., \$2. A guide and source book for teachers, administrators, and counselors in adult-education programs. The major emphasis is on the school situation, but the suggestions presented will be useful to anyone counseling adults—Y.M.C.A. and Y.W.C.A. workers, church and social agency staffs, counselors of veterans, and the like.

**CREATIVE CRAFTS IN WOOD**—Michael C. Dank—Manual Arts Press, 200 p., illus., \$3. Details on primary skills and techniques, described and illustrated one by one and applied to problems in coping saw work, wood chipping, and wood stippling.

**DESCRIPTIONS OF AND KEY TO AMERICAN POTATO VARIETIES**—C. F. Clark and P. M. Lombard—Government Printing Office, 50 p., tables and illus., paper, 10 cents.

**ENGINEERS' COUNCIL FOR PROFESSIONAL DEVELOPMENT: Thirteenth Annual Report for Year Ending Sept. 30, 1945**—Engineers' Council for Professional Development, 56 p., tables, paper, 25 cents.

**GERMAN FOR THE SCIENTIST**—Peter F. Wiener—Chemical Publishing Co., 238 p., \$3.50. A condensation of German grammar and reading material from modern German literature in chemistry and physics. Translations of the passages are also given.

**INTRODUCTION TO EMULSIONS**—George M. Sutheim—Chemical Publishing Co., 280 p., tables and diagrs., \$4.75. The principles, properties, methods of preparation and practical applications of emulsions. Includes a bibliography and an alphabetical list of emulsifying agents.

**MANAGEMENT CAN BE HUMAN**—Harvey Stowers—McGraw-Hill, 131 p., \$1.50. Practical advice for establishing better relationships between supervision and employees, and using actual case histories to illustrate each point.

**MEN, MIRRORS, AND STARS**—G. Edward Pendray—Harper, 335 p., illus., \$3, revised ed. An informative, popular book on the development of the telescope and on the parallel development of the science of astronomy.

**AN OUTLINE GUIDE TO THE ART OF THE SOUTH PACIFIC**—Paul S. Wingert—Columbia Univ. Press, 84 p., illus., \$2. For each major area and island group are given historical and geographical data, a description of the natives, and the distinctive elements of the culture; these are followed by a comprehensive listing of the art forms, for which physical facts, meaning, and function are included.

**PENNSYLVANIA GEOLOGY OF A PART OF THE SOUTHERN APPALACHIAN COAL FIELD**—Harold R. Wanless—Geological Society of America, 162 p., tables, illus., and maps, \$3.25. The Geological Society of America, Memoir 13.

**PRINCIPLES OF PHYSICS: II, Electricity and Magnetism**—Francis Weston Sears—Addison-Wesley, 400 p., tables and illus., \$5. The second volume of a series of texts written for the two-year course in general physics at Massachusetts Institute of Technology. A knowledge of mechanics, heat, sound, analytic geometry and some calculus is presupposed.

**PROBLEMS OF MEN**—John Dewey—Philosophical Library, 424 p., \$5. Essays on the general subjects of "Democracy and Education", "Human Nature and Scholarship", "Value and Thought", and on the philosophical systems of the thinkers Marsh, James, and Whitehead.

**PROGRESS AND PROBLEMS IN EDUCATION FOR LIBRARIANSHIP**—Joseph L. Wheeler—Carnegie Corp. of New York, 107 p., paper, free. A memorandum on matters affecting present-day training for librarianship, with especial reference to library schools, their faculties, graduates, students, curricula, relations to higher education and to the profession of librarian.

**SOLO OR SYMPHONY? Shall the Demobilized Doctor Enter Medical Group Practice?**—Medical Group Practice Council, 44 p., paper, 25 cents. An analysis of the nature of medical group practice, and of its advantages to patient and physician.

**SOME NOTES ON THE ARCHAEOLOGY OF THE DEPARTMENT OF PUNO, PERU**—Marion H. Tschopik—Peabody Museum of American Archaeology, 72 p., tables and illus., paper, \$1.65. Research project No. 7 of the Institute of Andean Research under the sponsorship of the Co-ordinator of Inter-American Affairs.

**A TEXTBOOK OF BIOCHEMISTRY**—Philip H. Mitchell—McGraw-Hill, 640 p., tables and illus., \$5. A textbook designed for a first course in biochemistry, presenting a modernized treatment of the essentials of biochemistry, centered upon metabolism and human nutrition. The newer work based on use of isotopes as tracers, of surviving tissue slices and other modern methods is given attention.

**WHAT ARE WE DOING WITH JAPAN?**—Anne and William Johnstone—Institute of Pacific Relations, 64 p., illus., paper, 25 cents. The factual record of American policy in Japan since V-J Day, with an analysis of the objective factors inherent in the Japanese national picture.

Science News Letter, June 1, 1946

A new process for cracking gasoline to produce superior aviation fuel, known as polytreating, uses solid phosphoric acid as a catalyst; the process removes undesirable components known as olefins, or converts them to useful hydrocarbons.

Turkey eggs, which will become more common now that a laying strain of turkeys has been developed, can not be distinguished from chicken eggs in flavor and texture, but are half again as large.



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Science News Letter, June 1, 1946

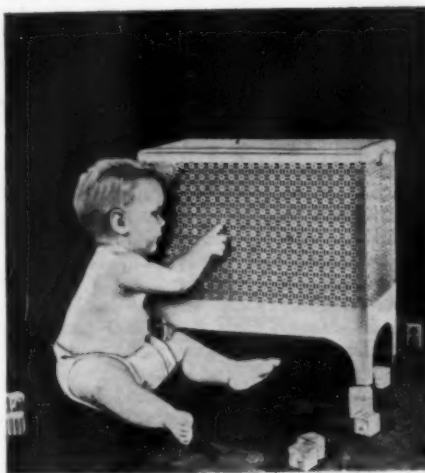
⚙️ **TWIN-LENS CAMERA**, in the medium price field, has shutter speeds from  $\frac{1}{2}$  to  $\frac{1}{200}$  second, and built-in flash synchronization. The viewing lens and the taking lens are geared together so that when the subject is in sharp focus on the ground glass, it is also in focus on the taking lens.

Science News Letter, June 1, 1946

⚙️ **COIN-OPERATED RADIO** for hotel rooms gives two hours of operation for a quarter. It looks like an ordinary radio receiver but has a slot for the coin, and the coin mechanism inside. An electric timing device, which operates only while the set is in operation, assures 120 minutes of program, continuous or intermittent.

Science News Letter, June 1, 1946

⚙️ **ELECTRIC roomheater**, housed as shown in the picture in an all-steel cabinet resembling the ordinary radiator cover, is safe if upset and keeps clothing



away from the heater wires. Two upright heating coils are used. Their large exposed surface areas reduce wattage per square inch to a point below incandescence.

Science News Letter, June 1, 1946

⚙️ **OIL REFINER**, to salvage used lubricating oil in small establishments and restore it to the quality of new oil, removes solid suspended impurities and dissolves contaminants, acids and fuel dilution. Various models designed for specific users are now in production.

Science News Letter, June 1, 1946

⚙️ **GRASS CUTTER**, to cut tall stems passed over by the ordinary lawnmower, is a two-wheeled affair with a handle and a series of pointed teeth between the wheels swung low over the ground. On each second tooth a double-edged razor blade is fixed, with both edges exposed, against which the stems are pressed.

Science News Letter, June 1, 1946

⚙️ **MAGNETIC-GRIP SHIELDS**, of transparent plastic with a strong small horseshoe magnet attached on one side, may be quickly stuck at any angle on lathes and other machines of iron to protect operators from flying particles. Better than goggles, they protect not only the eyes, but the entire face and body.

Science News Letter, June 1, 1946

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## Question Box

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chine in its job of chopping out weeds? p. 347.

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